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This part of the final report provides an historical context for a state technical information system by reviewing prior work toward establishment of state-wide cooperation among libraries, with particular emphasis on service to business and industry. It then outlines a network schematic which incorporates both geographic groupings and specialty groupings of libraries. It defines two kinds of centralized facilities: a processing center and a switching center. The processing center serves the function of producing for wide-scale distribution catalogs of the holdings of groups of libraries. The switching center serves as a directory service, providing both the information and the technology for facilitating communications among libraries. This part of the report concludes with a time-table for network development, covering efforts now underway or soon to be started and those planned for the future. (Author)

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A STATE LIBRARY-NETWORK FOR TECHNICAL INFORMATION SERVICE TO CALIFORNIA BUSINESS & INDUSTRY

K. D. Reilly

Part 2 of the Final Report on

Specification of a Mechanized
Center for Information Services
for a Public Library Reference Center

State Technical Services Act
Grant A 6 11-66

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Institute of Library Research
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ABSTRACT

Part 2 of the Final Report on Specification of a Mechanized Center for Information Services for a Public Library Reference Center discusses a general plan for a Network for Technical Information Services to California Business and Industry. This part of the report provides an historical context by reviewing prior work toward establishment of state-wide cooperation among libraries, with particular emphasis on service to business and industry. It then outlines a network schematic which incorporates both geographic groupings and specialty groupings of libraries. It defines two kinds of centralized facilities: a processing center and a switching center. The former serves the function of producing catalogs, or directories, of the holdings of groups of libraries, for wide-scale distribution; the latter serves as a directory service, providing both the information and the technology for facilitating communications among libraries. This part of the report concludes with a time-table for network development, covering efforts now underway or soon to be started and those planned for the future.

I. HISTORICAL DEVELOPMENT OF LIBRARY SERVICE IN CALIFORNIA

To provide historical context, we will focus our attention first on the stages that have led to the library network of California now being created.

EARLY EFFORTS

The origins of a statewide network go far back in history. The Union Catalog was established in 1909. It began as a union list of serials but later, as county libraries were being established, lists of books were also incorporated. As a result, an inter-library loan program began to be centered about the State Library. It has been successful, and an impressive number of loan requests (approximately 200,000) reach the State Library yearly. This early development signifies, to a large extent, what a fundamental role such a union catalog bears in a cooperative scheme.

In the 50's a new form of cooperative action became necessary as libraries began to handle special purpose materials, such as film. One film circuit in the northern part of the state has sixteen members including the Washoe County Library in Reno, Nevada. There are two similar ciruits in the South with twelve members each, and a third one is currently in formation. About the same time, centralizing ordering, cataloging, and processing of materials was introduced. The State Library now provides such services for twenty-one county and municipal libraries.

More recent efforts at statewide library planning in California began in 1958 with the Governor's Commission report prepared by Professor Edward A. Wight of the University of California. In 1962, the California Library Association led the way in planning activities, particularly in its early development of library standards for the State and more recently in its "Master Plan for Public Libraries in California".

According to the Master Plan for Public Libraries in California (as proposed to the California Library Association by the Library Development and Standards Committee in September 1962) there would be three types of local library systems:

1. Libraries serving a single large municipality through a system composed of a central library, branches, and bookmobiles.

2. Consolidated library systems serving all or part of one or more counties, including unincorporated areas plus, in many cases, a number of nearby but separately incorporated municipalities.

3. Cooperative library systems, which are brought about by affiliation and cooperation rather than by officially incorporating all the libraries into one library jurisdiction.

The Master Plan also enumerated the cooperative practices essential for success: cooperative book acquisitions with specialization in one or more subjects in each library; cooperative ordering, cataloging, processing to reduce costs; mutual acceptance of individual library borrower identification cards.

An increasing interest in cooperative joint action among public libraries came about with the passing of the Public Library Development Act in 1963. During 1964-65, some seventeen grants were made for exploratory studies of coordinated programs of service in some ninety-one libraries throughout the state. The formalized reports from these studies resulted in the substantial development of cooperative library systems in California.

THE MARTIN-BOWLER REPORT

Then in 1965, a most important statewide survey of California public library service was completed. Financed with federal funds under LSCA, it resulted in the so-called "Martin-Bowler Report", prepared by Dr. Lowell A. Martin, former Dean of the Graduate School of Library Service, Rutgers University, and Miss Roberta Bowler, retired Assistant City Librarian of the Los Angeles Public Library. Its purpose was to make an appraisal of the present situation in California and to propose an action pattern for future library service.

The program or plan of development proposed in the Martin report called for coordination and cooperation on a statewide basis and recommended a new comprehensive statewide network linking all public libraries. It incorporated various levels of service, from the local community library to regional reference and research centers, with the State Library serving as a statewide reference and research center. The State Library also was to serve as a coordinating body for the whole statewide arrangement.

Basic to the network proposed by the Martin Report is the concept of five levels of service (comparable to the structure in some East Coast states, including New York, Pennsylvania, New Jersey).*

Level I: Local Community Libraries. These libraries are to serve the most frequent reading needs of people (e.g., children's selections, general adult information sources, general community-interest materials, current popular books, etc.) and should be located within easy driving distance (fifteen to thirty minutes driving time being a representative range, with larger periods of driving time needed in more sparse areas). The Martin Report defines minimum standards for collection, staff, and budget.

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*Jean L. Connor. 1966., "Review of Public Library Service Equal to the Challenge of California; a Report to the State Librarian." News Notes of California Libraries, Vol. 61, No. 2.

Level II: Reader Subject Centers. These libraries are to provide resources and services beyond those which more advanced and specialized readers can expect to find in their immediate community, particularly high-level reference and bibliographic service from library personnel.

Level III: Library Systems. The Martin Report suggests that nine cooperative library systems be built up to cover the state: (1) North Coast, (2) East and South Bay Area, (3) Northern Mountain Region, (4) Northern Sacramento Valley, (5) Central Valley, (6) Lower San Joaquin Valley, (7) Santa Barbara Coast Area, (8) Greater Los Angeles Region, and (9) Greater San Diego Region. Membership in such systems would be voluntary. Libraries not in a system would still be eligible for state financial aid.

Systems should build toward a complete cooperative program, with appropriate structures (legal, policy making, and administrative) for coordinated action. One or more strong service points should be used to provide depth of resources and services for the total system. A program of centralized or joint provision of services (selection, acquisition, purchasing, cataloging, processing, etc.) and reciprocal use of materials should be included.

Level IV: Reference and Research Centers. Super libraries are needed in the concentrated metropolitan areas of California--San Francisco, Los Angeles, and Sacramento (and San Diego)* not only because of the need to serve large populations but also because of the special and technical nature of business and educational enterprises in these population centers.

The importance of the role of these "major resources" in a state-wide system cannot be overstressed. These libraries act as centers for inter-library reference, for consultation on specialized materials, and for inter-library loan requests from libraries throughout the state.

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*The Martin Bowler report limited its recommendations to Sacramento, San Francisco, and Los Angeles. Since then, San Diego has become an increasingly important center.

Level V: State Level Coordination. The State Library is to provide guidance with the State Librarian and the Assistant State Librarian to assume major responsibility for statewide planning and development.

CALIFORNIA COOPERATIVE SYSTEMS

The current programs in cooperative library systems give a view of the resulting pattern of public library services and activities within the cooperative library systems framework.

Collections are being enriched through increased purchases and cooperative specialization. Agreements on specialization have made it possible for member libraries to buy more widely in certain fields, within their own budgets, knowing that each member may freely call upon the collection of the other libraries for materials in other fields. Systems have allocated funds for purchase of special collections or for building up the holdings of each member. Union catalogs of system holdings, of current book acquisitions, of reference resources, and of serials have improved availability.

Private line teletype and TWX are widely used for reference, inter-library loan, and other communication purposes. Telephone services frequently supplement tele-typewriter services.

Some systems have pooled resources for systemwide bookmobile service. All have delivery services to carry daily inter-library loans and newly processed materials. Most systems have developed uniform cards for borrowers, so that individuals may have reciprocal borrowing privileges at any outlet in the system.

Various systems have sponsored workshops, institutes, in-service training programs, and the sharing of children's programs and story hours. (However, cooperatively planned or sponsored adult education programs have not as yet been undertaken by systems). There has been cooperation in

research projects such as cost studies and surveys. Systems have coordinated record keeping for statistics on inter-library loan, film use, books processed, etc.

As a result, there have been many benefits of cooperation, even though plans of service vary from system to system: improved book collections, faster inter-library exchange of books and information, more efficient and advanced techniques of book ordering and cataloging, borrower satisfaction in having free access to all the libraries in a system, and expanded reference services which give everyone access to the latest and most reliable information as well as to a wider variety of books on all subjects.

As of 30 June 1966, the following cooperative systems were in operation:

Black Gold Cooperative Library System. Established May 13, 1964. Members: Dean Hobbs Blanchard Memorial Library, Lompoc Public Library, San Luis Obispo County Library, San Luis Obispo Public Library, Santa Barbara Public Library, Santa Maria Public Library, Ventura County and City Library.
Total population served, 1965-66, 542,888.

Colton Public Library and San Bernardino Library System. Established in December 1965. Members: Colton Public Library, San Bernardino County Library.
Total population served, 1965-66, 416,100.

East Bay Cooperative Library System. Established June 9, 1964 as Alameda/Contra Costa CLS, December 1965 as East Bay. Members: Alameda Free (City) Library and Alameda County Library, Contra Costa County Library, Richmond Public Library.
Total population served, 1965-1966, 809,547.

Mother Lode Library System. Established October 6, 1965. Members: Auburn Public Library, El Dorado County Library, Placer County Library.
Total population served, 1965-66, 91,553.

North Bay Cooperative Library System. Established May 13, 1964. Members: Calistoga Public Library, Cloverdale Public Library, Lakeport Public Library, Marin County Library, Mendocino County Library, Mill Valley Public Library, Napa City-County Library, Pataluma Public Library, Santa Rosa-Sonoma County Public Library, Sausalito Public Library, Sebastopol Public Library, Solano County Library, Ukiah Public Library, Vacaville Union High School District Library, Vallejo Public Library.
Total population served, 1965-66, 598,376.

San Gabriel Vallen Library System. Established June 1, 1966. Members: Altadena Library District, Monrovia Public Library, Pasadena Public Library, Sierra Madre Public Library, South Pasadena Public Library.

Total population served, 1965-66, 222,668.

San Joaquin Valley Library System. Established May 1964. Members: Fresno County Library, Hanford Public Library, Kings County Library, Madera County Library.

Total population served, 1965-66, 508,700.

San Jose - Santa Clara - Sunnyvale Cooperative Library System. Established January 11, 1965. Members: San Jose Public Library, Santa Clara Public Library, Sunnyvale Public Library.

Total population served, 1965-66, 526,900.

Santa Clara Valley Library System. Established June 1, 1964. Members: Gilroy Public Library, Mt. View Public Library, Santa Clara County Free Library.

Total population served, 1965-66, 319,137.

Serra Cooperative Library System. Established May 28, 1965. Members: Carlsbad City Library, Chula Vista Public Library, National City Public Library, Oceanside Public Library, San Diego Public Library. Coronado Public Library will also join as of 1/1/68.

Total population served, 1965-66, 727,121.

Whittier - Santa Fe Springs - Los Cerritos Region of Los Angeles County Co-Operative Library System. Established December 1965. Members: Whittier Public Library, Santa Fe Springs City Library, Los Angeles County Public Library, Los Cerritos Region.

Total population served, 1965-66, 2,422,882.

THE CARTWRIGHT-SHOFFNER REPORT

Two closely related issues arose from the recommendations of the Martin-Bowler report: (1) The state-wide union catalog could be a key tool in facilitating inter-library loan throughout the state, but it will need to be more widely distributed. (2) The State Library itself served as one of the primary inter-library loan resources for the state, but its own catalog needed consolidation. This led to the initiation of a study in 1965, by the Institute of Library Research, of the implications of book form publication of these two catalogs.

The study led to the following conclusions published in the Cartwright-Shoffner report:*

(1) There is a need to have copies of both the State Library Catalog and the California Union Catalog available at public libraries throughout the state and this need can best be met by publication of them in book form.

(2) The use of a computer-based system for producing the book catalog would not only be economic in itself, but would make possible multiple uses of the resulting machine language catalog data.

(3) In particular, with the availability of machine-readable data created for the publication of the California Union Catalog, it would be economically possible to produce sub-catalogs of the holdings of any library system in the state. It was therefore recommended** that the services of the existing State Library Processing Center be expanded to provide mechanized facilities for book catalog production, as a service to library systems of the state as well as to the State Library itself.

The Cartwright-Shoffner report then presented a detailed discussion of the recommended content and form of the catalogs, recommended procedures for conversion of catalog data, and cost estimates for both conversion and production.

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*Cartwright, K. L., and Shoffner, R. M.: CATALOGS IN BOOK FORM: A Research Study of their Implications for the California State Library and the California Union Catalog, with a Design for their Implementation. Institute of Library Research, University of California, Berkeley, January, 1967.

**Report to the California State Library: Preliminary Evaluation of the Feasibility of Mechanization, Institute of Library Research, University of California, Berkeley, 1 January 1966.

THE BONN REPORT

In their report, Martin and Bowler placed particular emphasis on the needs of business:

> "Not only is the individual handicapped by sub-standard library facilities, but business and industrial enterprise also face an extra burden. California is a center for technical research and data processing, in a widening range of technology . . . A sound statewide system of public library service, up to specialized and research resources, is needed to sustain the business and research life of California".

The State Technical Services Act (Public Law 89-182) represents an effort to assure that information of scientific and technical nature--broadly defined--would be made more readily available to business, commerce and industry. The Bonn Report * was commissioned by the State Library for the purpose of determining what was possible in the public library system of California. His conclusion was that there was ". . . a remarkable agreement about the kinds of information that business and industry need":

1. Economic statistics, relating mostly to marketing matters;
2. Directories, including registries of business and industry throughout the nation;
3. Government publications;
4. Primary and secondary journals in areas of trade, finance, research.

But Bonn noted that the past role played by public libraries--especially if they indeed are the organization to provide information for business and industry--was not clearly defined. Technical works are expensive, very specialized, difficult to evaluate, troublesome to collect, and accordingly hard for a public library to justify. Though most of the

*Bonn, George: Technical Information for California Business and Industry, A Report to the California State Librarian, California State Library, Sacramento, California, December 1966.

needs for information theoretically can be met, the material sources are spread thin, collections are weak, and most libraries are ill prepared to meet the demands that could be placed against them. Access to information at any given point is difficult since the materials are not well cataloged. Bonn felt that communication between librarians and business people was difficult and that library staffs are unable to deal properly with the technical knowledge required. As a result of this past inability to meet their needs, most business men depend on other sources for information: small collections of reference works, trade publications, equipment suppliers, government agencies, and Chambers of Commerce.

The Bonn report concerns itself only in passing with computers, micro-photography, and communication techniques. However, he enumerates the present major published sources for bibliographical access to reports of federal research (CFSTI, the National Bureau of Standards, A.E.C., N.A.S.A., the National Library of Medicine, and other Federal agencies)--an area in which computers now play a role since much of this data is being put into machine-readable form. He expresses some doubt about the demand from small and medium-sized businesses for the technical information resources thus available, and about the ability of public libraries to utilize them.

Following Lowell Martin's organization plan for multiple levels of access, Bonn proposes a hierarchy of three levels in a network:

1. Research centers
2. Subject (reference) centers in the major public libraries
3. Local service-contact libraries

The Research Centers serve an especially important role, as consulting agencies and as a source for inter-library loan. Most of these libraries today are university academic research libraries. However, some public

libraries are to the point where they qualify as Research Centers, capable of providing the sort of service envisioned in the State Technical Services Act. Bonn viewed the participation of public libraries in this system as voluntary. Those libraries chosen for inclusion as reference centers are likely to be those which already demonstrate an interest in responding to the needs of the business community, particularly in the areas of science and technology.

The prime beneficiaries of information networks stand to be large organizations already familiar with what can be achieved. The problem of reaching organizations who do not have personnel for collecting, organizing, and disseminating potentially useful information therefore remains a serious one. In this respect Bonn feels strongly that personnel are going to be the important feature of the network. In Bonn's own words:

> "The success or failure of any statewide information network may well be determined at the very point where the patron with an interest in technical information first comes in contact with library service, whether it be a municipality's main library, a regional library, or selected neighborhood branch, or a comparable county library."

THE OLKEN SURVEY

In late 1966, Hyman Olken prepared a report on information resources for technological development. The bulk of the report is a Directory of Technical Information Resources which provides information on nationwide information centers, including university library systems, patent libraries, the California State Library System, Master Information Retrieval Centers, and Advanced Technology Information Analysis Centers. They cover a variety of specialty areas (e.g., aerospace, atomic and nuclear, chemical, electronics and electrical, medical, pharmacology, public health, weather, oceanography, and geology). Olken ranks sources of information by material

type and organization. Among the materials of most importance are the journals, books, Federal R & D Reports, and tape data; among the organization of most import are the University Libraries, depositories and regional documentation centers, Information Analysis Centers.

Olken envisions a network with a Switching Center and an inter-library loan service for Federal R & D Reports, based on the California State Library.

THE PROGRAMMING SERVICES INC. REPORT

The PSI report, Libraries and Industry, appeared late in 1967. It is one of a series of background studies for the National Advisory Commission on Libraries. It covers many phases of interaction between libraries and industry: library buildings; industry as a supplier of library materials; industry as a supplier of library equipment and supplies; library use by business and industry.

The PSI report begins with a discussion of the factors involved in the increasing use of libraries by industry. These reflect a new pattern of use, since the needs of industry tend to be more urgent and require greater resources. Information services important to business and industry (such as Bonn outlined) are therefore likely to be mechanized.

II. GENERAL NETWORK PLAN

The following "network plan" takes as its starting point the efforts to date (as summarized in Section I), with emphasis on information services to business and industry. It is based on the application of mechanized techniques to information service, library processing, and communication.

As shown in Figures 1 and 2, the network is composed of a set of interconnected libraries (the "nodes" of the network). Groups of libraries are of two types: Regional Groups and Speciality Groups. Each has a Group Center--a library formally designated to serve as the "Reference Center" (for a Regional Group) or the "Information Center" (for a Speciality Group).

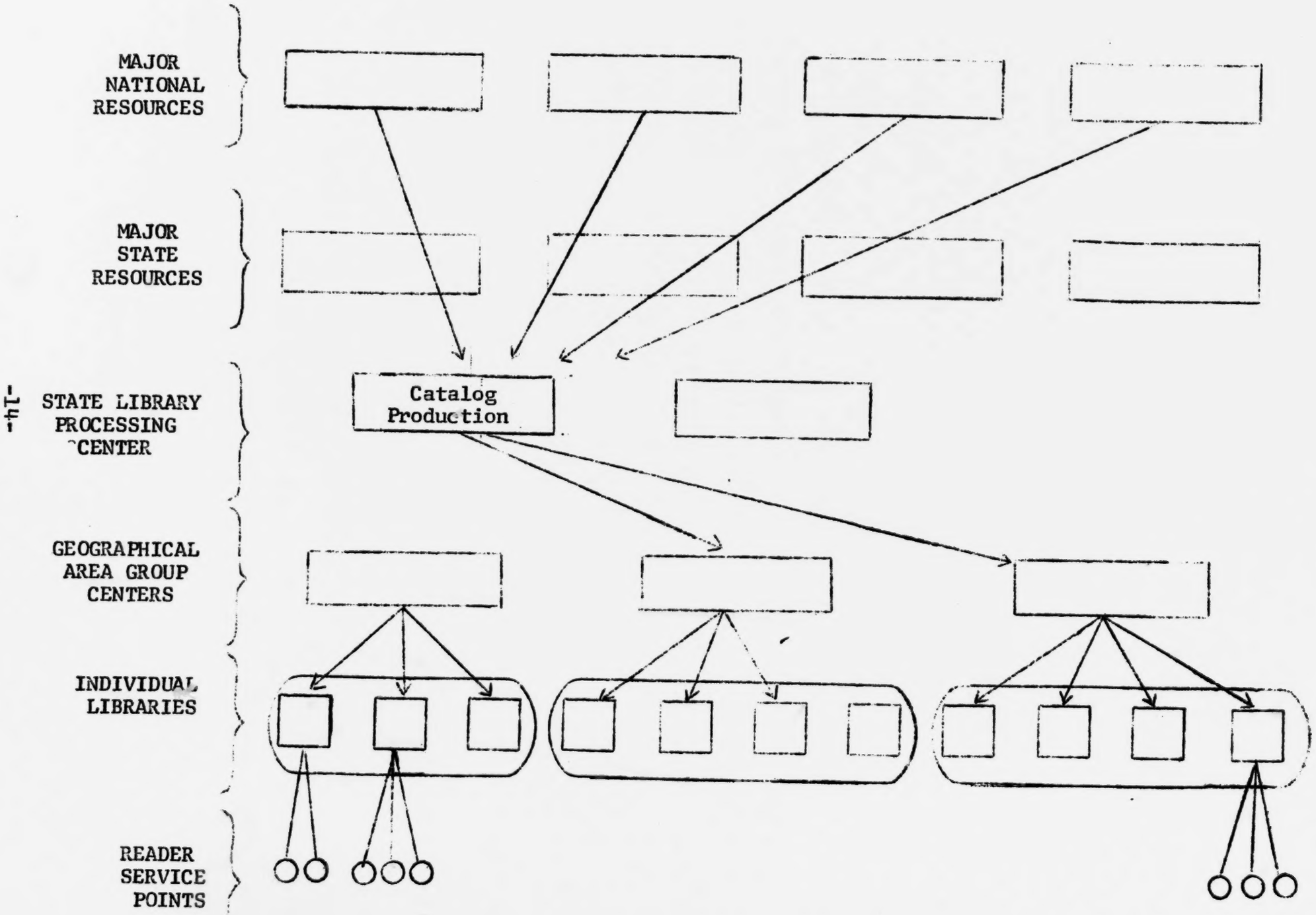
The operation of the network depends upon a "Processing Center" and a "Switching Center". The Processing Center's primary function, as far as the network is concerned,is the production and maintenance of directories of the holdings of the Regional Groups and Speciality Groups. The Switching Center's primary function is referral of information service requests to major state and/or national resources, when they cannot be satisfied by any of the group centers.

REGIONAL GROUP

The "region" defining the Regional Group is determined by demographic and geographical criteria. The Regional Group itself is a voluntary compact of cooperating libraries within the region formed for sharing of resources and utilizing a union catalog of group holdings as the means for facilitating access. Group affiliation within a region offers several possible benefits to a participating library: a wider range of resources, reduction in

FIGURE 1

PRODUCTION OF GEOGRAPHICAL AREA GROUP CATALOG



cataloging costs if the group catalog is acceptable, savings through centralization in purchasing and processing, reduction of duplicate materials. The time and money savings that accrue from these benefits will allow libraries to improve user-contact service and will allow for purchase of new materials. The concept of the "Regional Group" has been well covered in a prior section of this report.

SPECIALTY GROUPS

The Specialty Group is a voluntary compact of cooperating libraries located anywhere in the State whose functional relationships draw them together for the use of specialized resources. Examples of specialty areas include medicine, law, technology, educational media, etc:

SPECIALTY	EXISTING EFFORT
Medicine	National Library of Medicine Regional Medical Libraries
Education	ERIC Educational Media Centers
Technology	State Technical Service Act NASA Information Centers
Agriculture	National Agricultural Library Land Grant College Network

It is to be expected that many libraries will participate as members of more than one group. Typically, for example, a school library will be a member of both a regional group--sharing resources with the public and special libraries in the area--as well as an educational media group--sharing films, slides, etc. among the schools of the state--and perhaps even as part of an educational research group, drawing on the resources of research centers in support of faculty needs. As another example, a hospital library might participate in a regional group--usually drawing on the resources of the public library--as well as in the medical specialty group.

FIGURE 2

DEFINITION OF SPECIALTY GROUP CENTERS

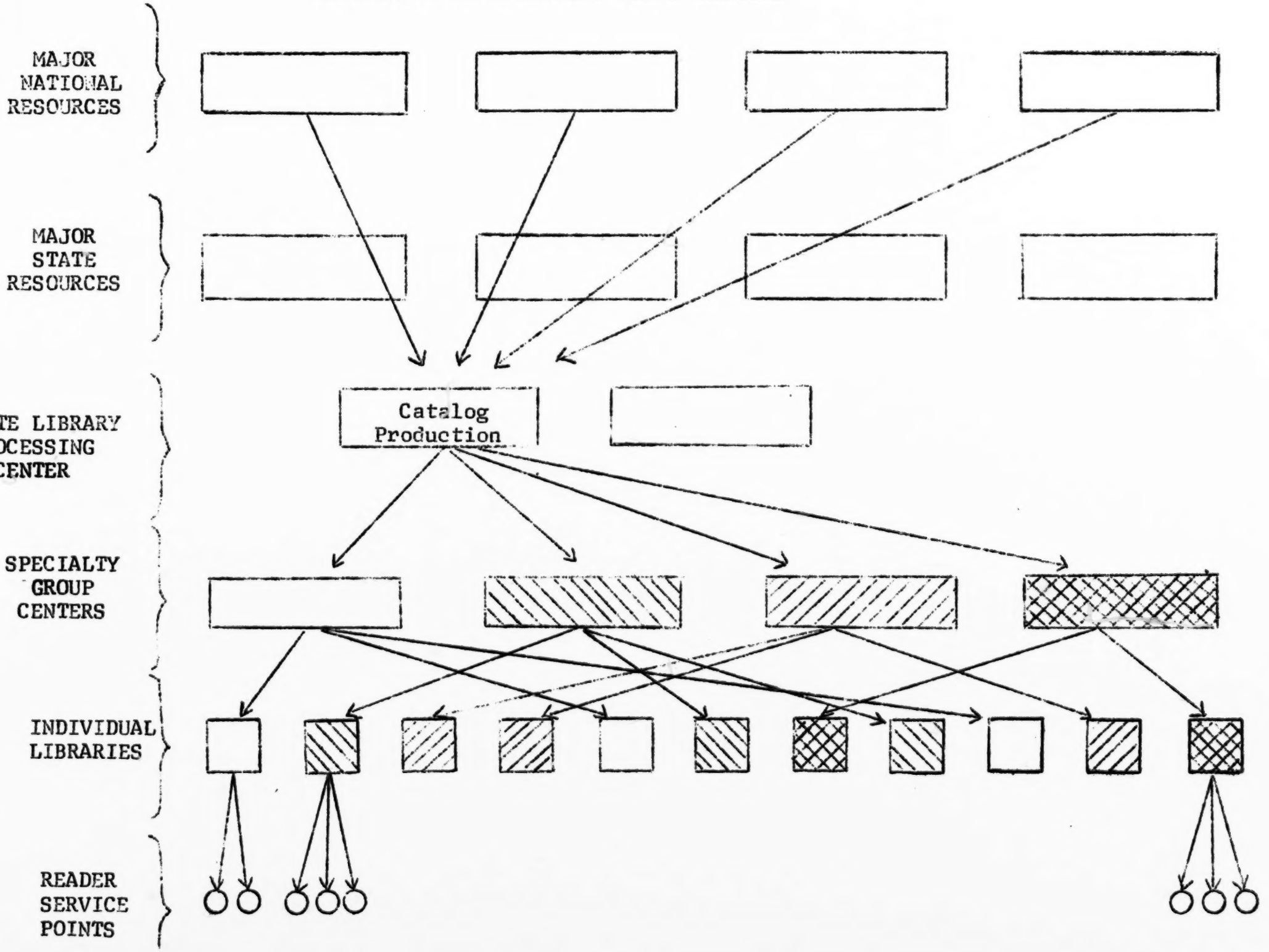
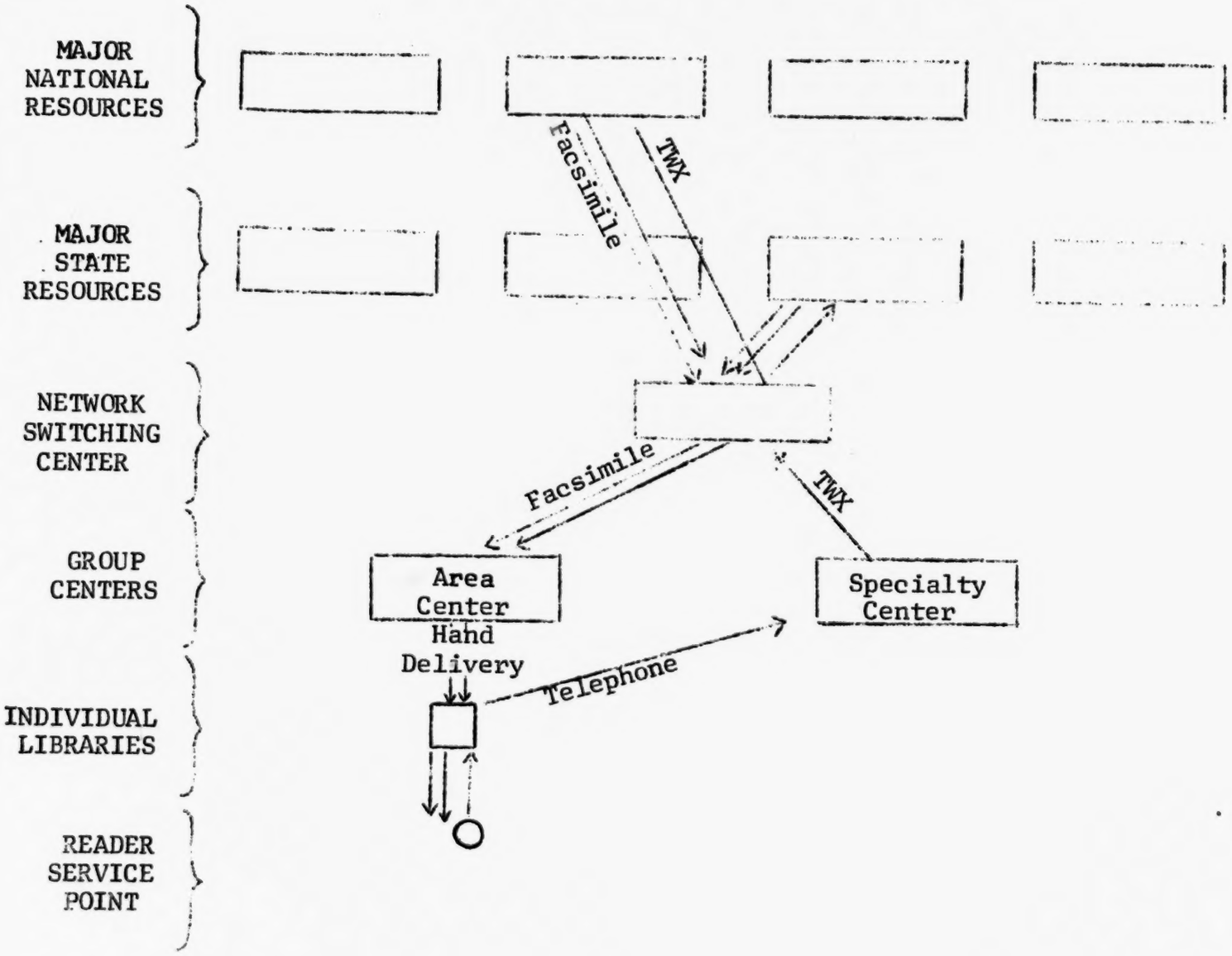


FIGURE 3

REPRESENTATIVE SCHEMATIC OF REQUEST TRANSMISSION



Industrial libraries in particular play an important role in creation of Specialty Groups. California efforts now in existence or in planning include the Pacific Aerospace Library, the plans of Harvey Mudd College, and the Sunnyvale Patent Library.

THE PROCESSING CENTER

Data (produced nationally as well as locally) will be acquired by the Processing Center in machine language (magnetic tapes) form according to the established standards of the Library of Congress MARC format. Book catalogs for the holdings of a group are produced, in standard format and arrangement. The frequency of publication, the number of copies printed, and the number of entries printed are matters of individual arrangement, based on established "costs per entry printed".

When a library becomes a participant in a group, catalog data on its existing collection will be drawn from the machine-based records for the State-wide Union Catalog in the standard magnetic tape format. Subsequent additions to collections would be included as a byproduct of book ordering operations. Identifying data (LC card number, for example) would be sent to the Processing Center for later extraction of relevant bibliographic data from available sources.

THE SWITCHING CENTER

Requests for service are received at local Service Points. The group union catalog(s) are examined to determine the availability of the material within the group. If the material item is available, it is borrowed on a direct service basis. If it is not, the request is transferred to the Switching Center for further handling. The Switching Center maintains a directory of the holdings of the Major Resources and principal groups from which services are available on an "inter-library loan" basis. Figure 3 presents a schematic diagram for the flow of requests in the Reader Service structure.

III. DEVELOPMENT TIMETABLE

Likely timing for the development of the network can be established. Of course, some major difficulties exist in predicting what will occur in fifteen years from now. The problems become far more complicated when we take into consideration that new kinds of document handling will be used and that new organizations will be called into play since no really highly active, integrated, mechanized network exists today.

To clarify and emphasize target dates for operational phases of various portions of the networks, an outline of the timing of events is provided in Figure 4.

The steps can be roughly divided into three stages. (See Figure 4 for more detailed breakdowns):

STAGE I. Efforts already underway or beginning in the next two to three years and expected to be in an operational phase by or before 1972. Among these efforts are several involving establishment of basic components of the network, especially acquiring of data for reference and production functions.

STAGE II. Efforts formally beginning in about three years (1970) and expected to be operational by or before 1976. Most of these activities are concerned with establishment of communications links within the network, the emphasis being to a large extent on facsimile and digital computer communication. Some are concerned with the data base handling.

STAGE III. Efforts beginning in the early and middle 1970's and expected to be operational (for the most part) between the middle and end of the decade.

FIGURE 4

DEVELOPMENTAL EVENTS, 1967-1980

EVENT	DESCRIPTION	DATE STARTED	DATE OPERATIONAL	DATE COMPLETED
STAGE I:				
1.	Establish processing center in State Library, with emphasis on Production of Book Catalog.	1969	1971	---
2.	Proceed with conversion of State Library catalog and California Union Catalog to machine language form.	1969	1970	
3.	Establish geographic regional cooperative groups encompassing all libraries in each region.	Underway	Underway	1970
4.	Establish "regional reference centers" in the dominant library of each region.	Underway	Underway	1970
5.	Produce union catalogs for the holdings of each geographical region.	1970	1971	---
6.	Acquire nationally produced machine-readable data at State Library Processing Center.	1969	1970	---
7.	Establish cooperative groups of libraries providing services in technical specialities.	1969	1970	---
8.	Establish "Primary center" for each speciality.	1969	1970	---
STAGE II:				
9.	Produce catalogs (union catalogs or catalogs of primary centers) for each speciality.	1970	1972	---

10.	Use state-wide telephone system for inter-library communication.	1970	1972	---
11.	Establish Switching Center including TWX, store and forward, digital computer communication.	1970	1974	---
12.	Use TWX from group centers to switching center to major resources.	1971	1974	---
	STAGE III:			
13.	Acquire machine-readable data at group centers for batch internal processing.	1972	1973	---
14.	Provide facsimile from major resources, through switching center, to group centers.	1972	1976	---
15.	Provide retrieval services to users of specialty centers (in batch processing mode).	1972	1974	1980
16.	Provide on-line computer services to clerical processing in group centers.	1972	1976	1980
17.	Provide on-line computer retrieval services to users of specialty centers.	1976	1980	---

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